INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
Exp. Date (11/30/2010)
Form No. (10-226)

Reporting Year:	**Park:**	**Select the type of permit this report addresses:**
2006	Shenandoah NP	Scientific Study

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Project Title (maximum 300 characters):

Geologic Map and Research of the Shenandoah National Park Region, VA

Park-assigned Study or Activity #:	**Park-assigned Permit #:**	**Permit Start Date:**	**Permit Expiration Date:**
SHEN-00306	SHEN-2007-SCI-0017	Oct 01, 2004	Sep 30, 2009

Scientific Study Starting Date:	**Estimated Scientific Study Ending Date:**
Oct 01, 2004	Sep 30, 2009

For either a Scientific Study or a Science Education Activity, the status is:

Continuing

For a Scientific Study that is completed, please check each of the following that applies:

__ A final report has been provided to the park or will be provided to the park within the next two years

__ Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park

__ All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed

Activity Type:

Research

Subject/Discipline:

Geology / General

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):

The Shenandoah National Park region is experiencing growth from the National Capital Region and geologic data are required for effective land and water management, both within the park and the adjacent communities. The 1:62,500-scale bedrock geologic map and report by Tom Gathright, VDMR, is out of print and needs revision. As part of the USGS-NPS Memorandum of Understanding, we are producing a new bedrock and surficial geologic map of the greater

park region using a combined FEDMAP, EDMAP, and STATEMAP research Team. Interdisciplinary research by USGS, NPS, and external scientists will utilize the new geologic database. A new interest in vegetation communities and ecology by NPS and other biological institutions will benefit greatly from data that helps define the current framework and past

conditions. Counties adjacent to the park are interested in geologic data applied to groundwater assessment. Specifically, Warren and Clarke Counties on the west side of the Blue Ridge are part of the Northern Shenandoah Valley Project that require data on the highlands of the basin. Fauquier County on the east side has requested additional geologic data as well.

The map area builds upon the recent work of the adjacent DC regional database (http://pubs.usgs.gov/of/of01-227/). We have an extensive collection of U-Pb and fission track data and are expanding our argon data to provide more than 3 transects to determine the structural and thermal history of this part of the central Appalachians. The Cenozoic history of the region is not well understood. We have an on-going investigation of surficial deposits

in the Paine Run watershed. The western flank of the Blue Ridge that is underlain by the siliclastic rocks of the Chilhowee Group. Streams draining these slopes have an unusually low pH due to the lack of buffering capacity in the soils. Slope processes, both currently active, and relict from severe climate conditions in the Pleistocene, are not well understood. Watersheds in the area contain numerous examples of tors, block fields and block slopes, block streams.

Stream valleys are filled with minor alluvial and debris-flow deposits. To the west along the footslopes of the Blue Ridge, large interlocking fans composed of debris-flow and alluvial deposits form a nearly continuous bajada. Segments of the fans overlie a karst terrane and the deposits are very thick. These dynamic processes will be studied by detailed mapping of surficial and bedrock geology within a single watershed, from its headwaters along the Blue Ridge summit

down to the Shenandoah River. Erosion and sediment transport in the Appalachian Blue Ridge is dominated by sporadic events of debris flows and stream flooding. In the past, however, the distribution of sediment was strongly controlled by mass wasting associated with ground ice. The radical shift in geomorphic response between these two end members demands a lag effect

transitional with climate change and a disequilibrium geomorphic response that reflects the preceding conditions. Analysis of surficial deposits reflecting the last 45,000 years provides a record of these transitions that will allow models for geomorphic response to be constructed.

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

see SHEN-2004-SCI-0021

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):	**Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):**
$0	$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year: